

U.S. Application No. 10/511,035
Declaration Under 37 CFR 1.132

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Kenichi Nakamura et al.

Group Art Unit: 1773

Application No. 10/511,035

Examiner: Monique R. Jackson

Filed: November 13, 2004

For: HIGH REFRACTION FILM, HIGH REFRACTION FILM-FORMING COATING
COMPOSITION, ANTI-REFRACTION FILM, PROTECTIVE FILM FOR
POLARIZING PLATE, POLARIZING PLATE AND IMAGE DISPLAY DEVICE

DECLARATION UNDER 37 CFR §1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Hiroyuki Yoneyama, do declare and state that:

I graduated from Tokyo Institute of Technology,
Interdisciplinary Graduate School of Science and Engineering,
Department of Electronic Chemistry, receiving a Master's Degree
in March of 1987.

I was employed by Fuji Photo Film Co., Ltd. (now FUJIFILM
Corporation) in April of 1987, from that time to November of 2003
I had been principally engaged in research and development relating
to a silver halide color print photosensitive material, mainly at
Ashigara Laboratories of said company, and since November of 2003
I have been engaged in research and development of an antireflective

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film, mainly at the Flat Panel Display Materials Research Laboratories of said company.

I reviewed the Office Action dated April 6, 2007 issued in the above-identified application.

The following additional experimentation was conducted by me or under my supervision to demonstrate the unexpected superiority of the presently claimed high refraction film over anti-reflection film using compounds disclosed in Nakamura et al. EP 1089093.

EXPERIMENTATION

According to Examples [1]6-27 on pages 185-188 of specification, materials for the comparative experiment to compare to an anti-reflection film including a middle refraction layer and high refraction layer containing cobalt-containing titanium dioxide fine particles are obtained.

Comparative Example A

(Preparation of titanium dioxide fine particles)

Iron-containing titanium dioxide fine particles doped with iron therein were prepared according to known methods for the preparation of titanium dioxide fine particles and for doping (disclosed in JP-A-5-330825) except that doped amount of iron (Fe) was changed.

The doped amount of iron was 100/2 as calculated in terms

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of Ti/Fe (by weight).

The titanium dioxide fine particles thus prepared were recognized to have a rutile type crystal structure and had an average primary particle size of 41 nm and a specific surface area of 45 m²/g.

Comparative Example B

(Preparation of titanium dioxide fine particles)

Aluminum-containing titanium dioxide fine particles doped with aluminum therein were prepared according to a known method for the preparation of titanium dioxide fine particles and for doping (disclosed in JP-A-5-330825) except that iron (Fe) was replaced by aluminum (Al).

The doped amount of aluminum was 100/2 as calculated in terms of Ti/Al (by weight).

The titanium dioxide fine particles thus prepared were recognized to have a rutile type crystal structure and had an average primary particle size of 41 nm and a specific surface area of 45 m²/g.

Comparative Example C

(Preparation of titanium dioxide fine particles)

Zirconium-containing titanium dioxide fine particles doped with zirconium therein were prepared according to a known method for the preparation of titanium dioxide fine particles and for doping (disclosed in JP-A-5-330825) except that iron (Fe) was

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replaced by zirconium (Zr).

The doped amount of zirconium was 100/2 as calculated in terms of Ti/Zr (by weight).

The titanium dioxide fine particles thus prepared were recognized to have a rutile type crystal structure and had an average primary particle size of 41 nm and a specific surface area of 45 m²/g.

Comparative Example D

(Preparation of titanium dioxide fine particles)

Titanium dioxide fine particles were prepared in the same manner as in Comparative Example 8-A except that none element is doped.

The titanium dioxide fine particles thus prepared were recognized to have a rutile type crystal structure and had an average primary particle size of 39 nm and a specific surface area of 42 m²/g.

(Preparation of anti-reflection film)

Anti-reflection films were prepared in the same manner as in Examples 1-27 except that Titanium dioxide fine particles used in Examples 1-27 is replaced by Titanium dioxide fine particles obtained in Comparative Examples A-D.

The anti-reflection films thus prepared were then evaluated for checkerboard adhesiveness and light-resistance. The results are shown in Table 1.

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Here, as described on pages 141-142 of specification, the results of checkerboard adhesiveness were then evaluated according to the following 4-step criterion.

E: No checkers observed peeled out of 100 checkers

G: 2 or less checkers observed peeled out of 100 checkers

F: 3 to 10 checkers observed peeled out of 100 checkers

P: More than 10 checkers observed peeled out of 100 checkers

In addition, as described on pages 142-143, the results of light-resistant were then evaluated according to the following 4-step criterion.

E: No checkers observed peeled out of 100 checkers

G: 2 or less checkers observed peeled out of 100 checkers

F: 3 to 10 checkers observed peeled out of 100 checkers

P: More than 10 checkers observed peeled out of 100 checkers

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Table 1

	Doped metallic species	Checkerboard adhesiveness	Light-resistant		
			100 hours	200 hours	300 hours
Example 6-27	Co	E	E	E	G
Comparative Example A	Fe	E	E	G	F
Comparative Example B	Al	E	E	G	F
Comparative Example C	Zr	E	E	G	F
Comparative Example D	-	E	G	F	P

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The table 1 showed that the anti-reflection film containing cobalt-containing titanium dioxide fine particles was excellent in the light-resistance. Also, the table 1 showed that the anti-reflection films containing each of iron-, aluminum- and zirconium-containing titanium dioxide fine particles were inferior to the cobalt-containing titanium dioxide fine particles in the light-resistance.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: July 25, 2007

Hirofumi Yoneyama
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